a property of gases to liquids and to solids, by C. Cellèrier.—Recent changes in the appearances of Jupiter, by E. Gautier.

Atti della R. Accademia dei Lincei, vol. vi. fasc. 8.—Observations on the topography of the planet Mars, by G. Schiaparelli.—Communication on a geyser discovered at Montrond (Loire), by F. Lauri.—On the same subject, by F. Keller.—On the embryo of *Cuphea*, by G. Briosi.—Influence of different electric resistances on the dimensions of the excitative spark of condensers, by E. Villari.—On the dynamical value of a calorie, by G. Cantoni and G. Gerosa.—Oxidation of titanic acid, by A. Piccini.—Reports.

Morphologisches Jahrbuch. Eine Zeitschrift für Anatomie und Entwickelungsgeschichte, Bd 7, Heft iv., 1882, contains—Dr. Hans Virchow, on the lens and retinal vessels of the eel (pl. 27).—Dr. Sigbert Ganser, comparative anatomy studies of the brain of the mole, pp. 590, 725 (plates 28-32.—A most minute and painstaking account of the mole's brain), Dr. W. Pfitzner.—On nerve-endings in epithelium (pl. 33).

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, May 11.—S. Roberts, F.R.S., president, in the chair.—Mr. A. L. Daniels was elected a Member.—Dr. Hirst, F.R.S., communicated an account (similar to that he had given before the Royal Society in the afternoon of the same day) of a paper by M. Vanecek entitled "Sur l'Inversion générale."—The following further communications were made:—Elementary analytical proof of Graves's and MacCullagh's theorems, with an extension of the former, by J. Griffiths.—Note on a system of confocal bicircular quartics, by R. A. Roberts.—On the vibrations of an elastic sphere, by Prof. Lamb.—On a formula relating to elliptic integrals of the third kind, by Prof. Cayley, F.R.S.; and a short note by the president.

Physical Society, May 6.—Prof. Clifton, president, in the chair.—New Member, Mr. W. H. Heaton.—Mr. Lecky described a form of battery arranged by Mr. A. R. Bennet, of Glasgow, at a cost of 6*d*. per cell. The vessel and electro-negative plate consists of an iron meat or milk tin, into which is placed a porous pot containing a zinc plate stuck in a paraffined cork cover, fitting the porous pot. A solution of caustic soda is the liquid. In it iron does not rust, and is electro-negative to zinc. The electromotive force is 1·23 volts where the Daniel is taken as 1 volt and the Leclanché as 1·30 volts. Iron filings round the iron plate facilitate depolarisation by the escape of hydrogen from their points. The cell pitted against a Leclanché was found to ring an electric bell even longer than the latter.—Prof. Guthrie (in the absence of Dr. F. D. Brown, the author) gave a summary of a paper entitled "Notes on Thermometry." This described a method of calibrating the tubes by means of a microscope having an extra half-lens before the object-glass, which focussed the end of the mercury column, whilst the other lens focussed the tube, so that no alteration of the focus of the microscope was necessary in making an observation. Dr. Brown also found that a constant zero temperature was better obtained from a mixture of ice and water than from drained ice; and that it was preferable to mix the ice with distilled water rather than ordinary water. Acting on the suggestion of Dr. Guthrie, Dr. Whipple, of Kew, had found that the ice itself might be from different sources without appreciably affecting the result. Dr. Whipple called attention to the change of zero in thermometers by heating, and recommended buyers to see that makers had not let them be heated after their calibration. Mr. J. Macfarlane Gray suggested that the thermometers used by Regnault should be examined now, as our standards are based on his results. Prof. Clifton pointed out that the half-lens in the microscope would probably distort the image of the mercury column.—Prof. Guthrie then read a paper on the repulsion of a suspended horseshoe magnet by a rotating copper disc below it. He gave tables of quantitative results and a plotted curve, showing that the repulsion varied on the square of the rate of rotation. For a surface velocity of the disc of 163 metres per minute the repulsion was ·41 grammes.

Anthropological Institute, May 9, Major-General Pitt Rivers, F.R.S., president, in the chair.—The election of Mr. Henry Ling Roth was announced. Mr. G. M. Atkinson made some remarks upon a palæolithic implement found eighteen feet below the bed of the Thames at Chelsea, and exhibited by Mr. Lambton Young, C.E., and a jet ornament from Garvagh, co. Londonderry, exhibited by Mr. A. G. Geoghegan. — Mr. Worthington G. Smith exhibited a series of large palæolithic implements recently discovered.—Dr. Beddoe, F.R.S., read a paper on the evidence of surnames as to ethnological changes in England. The discussion was sustained by Messrs. Hyde Clarke, Holt, Park Harrison, Prideaux, Atkinson, C. Roberts and the chairman.—Mr. Park Harrison, M.A., read a paper on the survival of certain racial features in the population of the British Isles at the present day. Dr. Beddoe, Prof. Thane, Mr. Atkinson, and the president joined in the discussion.

Institution of Civil Engineers, May 9.—Sir Frederick Bramwell, vice-president, in the chair.—The paper read was on "Coal Washing," by Mr. Thos. F. Harvey, Assoc.M.Inst.C.E.

Royal Horticultural Society, May 9.—Sir J. D. Hooker in the chair.—*Larches attacked by Larvæ:* From a communication received by Sir J. D. Hooker it would appear that the trees mentioned in the last report had suffered much more extensively than was supposed, whole trees having been stripped of their foliage.—*Fungus in Dilute Sulphuric Acid:* Mr. W. G. Smith exhibited a specimen of the vinegar fungus, *Penicillium crustaceum*, growing in dilute sulphuric acid. Sir J. D. Hooker suggested it should be ascertained what nitrogenous substance was present in the acid, which alone could not support life.—*Proliferous Mushroom:* He also exhibited a specimen in which one pileus was inverted and adherent to the summit of another mushroom growing in the ordinary way.—*Foliage Injured by the Gale:* Dr. M. T. Masters exhibited leaves injured in various ways by the late severe gale, which by destroying the growing parts only revealed the different developmental orders of leaves. It appeared that salt spray had injured trees in some cases; but it was thought that the duration and great cold of the wind was more generally the cause of injury. Beeches, it was noticed, withstood it better than oaks.

Victoria (Philosophical) Institute.—A paper was read by Prof. Lionel S. Beale, F.R.S., on "Dictatorial and Scientific Utterances and the Decline of Thought." The author tried to show that the opinion now generally entertained by scientific men that the phenomena of the living world are due to the properties of the material particles is erroneous.

BERLIN

Physiological Society, May 5.—Prof. du Bois Reymond, president, in the chair.—Dr. J. Sander read a paper upon the distribution of the vaso-motor nerve-centres. In addition to the well-known centre of the vaso-motor nerves in the medulla-oblongata, several other centres in the spinal chord were determined by the experiments that were made. In the case of each of these centres the degree of stimulation was determined which produced the greatest effect, and beyond which no further excitation produced a rise in the blood-pressure. If this degree of maximum excitation was not reached, a cumulative effect was perceived by the simultaneous stimulation of two vaso-motor centres, and the weak excitation of two centres had always a much greater effect than that which would have been expected to result from the degree of stimulation. The increased blood-pressure that resulted from the stimulation of the centre lasted for a prolonged period, which proves that the smooth muscular tissue of the walls of the blood-vessels does not tire quickly.—In a previous meeting of the Society held on March 29, Dr. R. Koch had demonstrated his important discovery that tuberculosis is a parasitic disease, that its occurrence is connected with the presence of tubercle Bacillæ, which are always found in those tissues which had undergone tubercular change. The Bacillæ can be isolated and can be cultivated for long periods quite isolated; animals that were infected with the isolated bacteria by very different methods became, without exception, affected with tuberculosis. The important demonstration of these tubercle Bacillæ was accomplished by Dr. Koch by a staining method which consisted in the employment of an alkaline solution of methyl-blue and a watery Vesuvian solution (*Vesuvialösung*); under this treatment all tissues and cells became stained brown, while the tubercle Bacillæ alone became stained blue; by this means it was easy to demonstrate the tubercle Bacillæ in the excreta of consumptive patients, in which they regularly occur. This interesting relation of the tubercle-Bacillæ to the staining-fluids has been made the subject of investigation by Dr. Ehrlich, the principal results of which may be condensed into the statement that the cause of this extra-

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ordinary appearance lies in the particular properties of the ectoderm of the tubercle-Bacillæ, which is penetrable by alkaline fluids, and therefore also for alkaline methyl-blue, whereas it is impenetrable by neutral substances, and especially by acids. Even the application of the strongest mineral acids, such as sulphuric acid, nitric acid, and such like, produced no effect on the Bacillæ. This peculiarity of the tubercle-Bacillæ has, besides its scientific, also, a remarkable practical importance, as it teaches that no acid fluids are to be used in disinfection, or for the purpose of killing tubercle-Bacillæ, as their ectoderm is impenetrable by such, but that alkaline-solutions are to be used, as they become easily diffused into the interior and destroy the Bacillæ.—Prof. Baumann reported on the examination of two pieces of a Termite's nest, which Prof. Renlau had brought from Australia. The one piece was taken from the outer wall of a structure that was apparently inhabited by ants; the second came from the inner structure of the nest. The first was free from organic matter, and consisted almost entirely of clay containing iron; the second was of a brownish-colour, perforated in all directions with numerous passages, and consisted almost entirely of organic material. While the most careful microscopical examination did not reveal any trace of an organic structure, still on the other hand a chemical analysis showed a chemical composition very like that of most woods. Both the proportion of carbon and the amount and composition of the ash showed that this structureless substance is most nearly allied to wood. Mr. Baumann, consequently, looked for cellulose in the wall of the nest, and found it present in large quantities, so that there hardly remained a shadow of doubt but that the mass was derived from wood. The specific gravity was found to be 1·36, *i.e.* greater than that of the heaviest woods. The other constituents of this substance, which consisted of 97 per cent. of organic materials, afforded no assistance in the solution of the question as to whether this structureless mass had been formed out of wood, or as to how it had been manufactured by the animals.

PARIS

Academy of Sciences, May 8.—M. Jamin in the chair.—The following papers were read:—On the effects produced in vacuum by the current of Gramme machines, by MM. Jamin and Maneuvrièr. In an electric egg, with carbons (vacuum about 12mm.), a phenomenon like that of Geissler tubes is produced by the two currents, which contribute equally; but it is much more brilliant; the carbons soon get heated to a pale white throughout, and volatilised, giving a blue vapour, which condenses, and makes the egg opaque. This volatilisation was mostly avoided, in another case, by using two groups of carbons (instead of the pair) diverging from the rheophores towards each other, cone-wise. A large number of *effluves* here take the place of one. Still brighter effects were had with copper rods so arranged.—General considerations on preventers of fire, or pyroscopes, by M. Ledieu. After noting the faults of some methods, he indicates a system in which a cylinder of strong insulating material, holding a liquid which is refractory to electrolysation, and has good conductivity, increasing decidedly with temperature, is interposed in a single circuit, a platinum rheophore entering the liquid at either end. Absolute alcohol is a suitable liquid.—M. de Freycinet was elected Free Member in place of the late M. Bussy.—Report on a memoir relating to albuminoid matters, was presented to the Academy by M. Béchamp. The author has determined the rotatory power of a large number of these matters, and given elementary analyses of the best characterised species. The power, which fibrine has, of decomposing oxygenated water, resides, M. Béchamp proves, in the granular substance (albuminoid), left as an insoluble residue, on treatment of fibrine with weak hydrochloric acid. Raised to boiling in water, this loses its power. Again, M. Béchamp shows that it is a property of all albuminoid matters (as of albumen), that their oxidation by means of permanganate of potash furnishes a certain quantity of urea.—Report of the Commission charged to examine the work presented by Rear Admiral Serre "On the Athenian Trireme."—Researches on one of the principal bases of doctrines relative to the mechanism of production of voluntary movements and convulsions, by M. Brown-Séquard. It must be allowed that the excitomotor zone of the cerebral surface and of all excitable parts of the brain can set in motion the limbs of the corresponding side like those of the opposite side, and this after transverse section of a lateral half of the bridge of Varoli, the bulb, or the cervical cord, or even after two sections—one of the right, the other of the left half of the base of the brain—provided there is a certain interval between the sections.—On the winter egg of phylloxera, by M. Henneguy.—On the spherical representation of surfaces, by M. Darboux.—On the tides of Campbell's Island, by M. Bouquet de la Grye. *Inter alia*, the retardation of the tide is twenty-four hours.—Remarks on the velocity of light, on the occasion of two memoirs of Lord Rayleigh, by M. Gouy. Both appear to have come to the same conclusions and formulæ independently. M. Gouy obtains the result (among others) that *perfectly homogeneous* light is necessarily formed of an indefinite series of equal waves, without perturbations or irregularities of any sort.—On the depression of the zero point in mercury thermometers, by M. Crafts. The greater the interval between the temperature that has produced a depression, and that at which the thermometer is kept to raise it again, the slower is the movement, and it may be incomplete if the interval considerably exceeds 100°. M. Crafts gives a table by which the depressions through heating Paris thermometers may be estimated.—On the polarisation of electrodes and the conductivity of liquids (continued), by M. Bouty. He results obtained by the method previously indicated. He gives extends to the case of mixtures M. Berthelot's law for that of simple electrolytes.—Magnetic variations of magnetised bars during thunderstorms, by M. de Lalagade. With a thin iron membrane mounted, as in a telephone, at the end of a magnetised steel bar, he heard a small dry sound at each lightning-flash. Better effects were had with twelve horizontal magnets, each having twelve coils at one end, the wires connected with two conductors and two telephones. Sounds were heard before as well as during each flash.—On a balloon ascent at Paris on May 7, 1882, by M. Eloy. Starting about midday they rose 300 m. in a south east current, then to 1400 m. in a north-east one, above which a south-east current was met with again. Up to 1400 m. the average fall of temperature was 1° for 100 m., but at 1900 m. (the highest point reached), the thermometer was above the indication at 1400°.—On the composition and the equivalent in volume of pernitric acid, by MM. Hautefeuille and Chappuis. The formula NO_6 is arrived at.—Action of potash on oxide of lead, by M. Ditte.—On phosphate of chromium, and its utilisation in chemical analysis and industry, by M. Carnot.—Studies on the photo-chemical reaction of peroxalate of iron, by M. Jodin. For several years he has used the substance in experiments on plant-physiology, to supply CO_2 to plants by decomposition in light. The quantity liberated varies considerably with the composition of the solutions.—On new carbo-siliciated compounds, by M. Colson.—On homologous and isomeric rosanilines, by MM. Rosenstiehl and Gerber.—Chemical composition of the ash thrown out by Vesuvius on February 25, 1882, by M. Ricciardi.—Study on the antiseptic properties of salicylic acid, by MM. Robinet and Pellet. They describe experiments with salicylised must, showing that beyond 0·3 gr. per litre, salicylic acid is a powerful antiseptic, and that at 1 gr. it destroys even the action of yeast.—A claim of priority, in the idea of the photographic gun, was put in for M. Leblond.

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